## REMARKS

The following remarks are believed to be fully responsive to the outstanding Office Action and are believed to place the application in condition for allowance.

The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the remarks as set forth hereunder. First, Applicants note that the abstract of the application has been added on a separate sheet, as required in the Office Action (see above amendment).

I. Rejection under 35 U.S.C. § 102(e)

With regard to the rejection under 35 U.S.C. § 102(e), the Examiner has alleged that claims 1, 2, 4-10, 12, 13, and 14 are anticipated by Baguisi et al., U.S. Patent Publication No. 2002/0162134. This rejection is respectfully traversed.

The Examiner has pointed out that the present specification states that spermatogonial cells of avian originate from primordial germ cells (PGCs). In addition, the Examiner has stated that there is no clear distinction between PGCs and SSCs (spermatogonial stem cells).

However, it is noteworthy that there are crucial differences between the PGCs and SSCs in view of their isolation sources and morphology.

With respect to their isolation sources, the PGCs are derived from ***embryonic gonad***, which is composed of undifferentiated types of cells, and become differentiated into gonocytes. On the contrary, the SSCs are derived from ***testis of adult chicken***, which comprises totally differentiated cell types.

In the Examples of the Baguishi reference, it is stated that PGCs are obtained from gonad of ***chick embryos*** incubated for at least 6.5 days (corresponding to ***stages 29-36 of development***)

(see the paragraphs [0007], [0035], [0047], [0069], and [0101]). However, the SSCs of the present invention are prepared from testicular cells of ***testis of the adult chicken*** of ***aged of up to 70 weeks*** (see the paragraphs [0023] to [0027]).

In addition, PGCs significantly differ from SSCs in view of morphologies. For example, PGCs have many vacuoles in the cytoplasm and well-developed pseudopodia are found in the membrane of PGCs. In some case, PGCs also have many lipid drops in the cytoplasm for energy source for migrations or active movements. On the contrary, SSCs do not have these organelles or structures. Further, the size of SSCs is bigger than other stromal cells, however, SSCs are tighter and smaller than PGCs. Still another difference between PGCs and SSCs is that PGCs are more slowly growing *in vitro* or *in vivo* (2-3 days per doubling), however, SSCs are growing faster (less 2 days) than PGCs.

Further, although the Examiner has pointed out that Baguisi teaches the isolated avian gonad cell from testis, there is no description of actually obtaining gonad cell from testis in Baguisi. Therefore, it is clearly evident that there is no teaching of preparing the SSCs from chicken testis in the Baguisi reference.

Accordingly, it is clear that the SSCs of the present invention are different types of cells from the embryonic cell derived PGCs described in the Baguisi reference.

Consequently, the Applicant respectfully requests that this rejection be withdrawn.

II. Rejection under 35 U.S.C. § 103(a)

The Examiner rejected claims 1, 3, 11, and 15 as being unpatentable over Baguisi et al. and Shinohara et al. (U.S. Patent Publication No. 2006/0265774). This rejection is respectfully

traversed.

The presently claimed invention relates to a novel method of long term culture of chicken spermatogonial stem cells (SSCs) prepared from the testicular cells of ***testis of adult chicken***.

The instant claims have the characteristics of (i) preparing a chicken testis, (ii) isolating a population of testicular cells from said chicken testis, and (iii) culturing the chicken spermatogonial stem cells (SSCs) in said population of testicular cells on a feeder cell layer in a medium containing a growth factor.

As discussed above, the Baguisi reference, U.S. Patent Publication No. 2002/0162134, discloses the isolation of **PGCs** from chicken **embryonic** gonad cell. The reference does not disclose the method of preparing **SSCs** from testicular cells of **adult chicken testis**.

The Shinohara reference, U.S. Patent Publication No. 2006/0265774, discloses a method of growing spermatogonial stem cell (SSCs) from the testis of mammalian, especially **mouse** (see paragraphs [0045], [0064] and [0065]). However, the reference does not teach the culturing method of the SSCs from **chicken** testis. The developmental system and differentiation process of mammalian cells have significantly different characteristics as compared to those of avian cells. For example, it is well known in the art that the activity of alkaline phosphatase (AP) is detected in the ***mouse*** SSCs, but not in the ***chicken*** SSCs. In addition, there are significant differences between mouse SSCs and chicken SSCs in morphology and shape of colony. In particular, mouse SSCs grow like mouse ES cells, in a very tightly gathered colony formation, while chicken SSCs form only a very sparse colony, containing 8-10 cells in a colony.

The cited references do not disclose the technical features of the present invention and do not provide any suggestion or motivation with respect to the same. Hence, contrary to the

Examiner's allegation, a skilled person would have had no reasonable expectation that chicken spermatogonial stem cells (SSCs) from the testis of adult chicken could be successfully cultured in long-term, as recited in the present claims.

We would therefore ask that the Examiner's rejection be withdrawn.

## CONCLUSION

With regard to the rejection under 35 U.S.C. § 102(e), the Baguisi reference does disclose the preparation of the PGCs from chicken embryonic cells, but does not disclose the preparation of SSCs from chicken testis.

In addition, with regard to the rejection under 35 U.S.C. § 103(a), the Shinohara reference discloses the preparation of mouse SSCs, but not chicken SSCs, and there are substantial differences between SSCs from these different sources.

Consequently, the references indicated by the Examiner do not teach or suggest the technical features of the present invention. Accordingly, a skilled person would have had no reasonable expectation that chicken spermatogonial stem cells from the testis of adult chicken could be successfully cultured in long-term.

Therefore, in view of the foregoing remarks, the Applicant respectfully requests the reconsideration and reexamination of this invention and the timely allowance of the pending claims.

If there are any other charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

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